Amendments to the Specification:

Please replace the paragraph beginning on page 1, line 11 as follows:

As is well known to control engineers, the automation of complex mechanical systems is not something easy to achieve. Among such systems, conventional powered artificial limbs are notorious for having control problems. These conventional prostheses are equipped with basic controllers that artificially mobilize the joints without any interaction from the amputee and are only capable of generating basic motions. Such basic controllers do not take into consideration the dynamic conditions of the working environment, regardless of the fact that the prosthesis is required to generate appropriate control within a practical application. They are generally lacking in predictive control strategies necessary to anticipate the artificial limb's response as well as lacking in adaptive regulation enabling the adjustment of the control parameters to the dynamics of the prosthesis. Because human limb mobility is a complex process including voluntary, reflex and random events at the same time, conventional prostheses do not have the capability to interact simultaneously with the human body and the external environment in order to have minimal appropriate functioning.

Please replace the paragraph beginning on page 1, line 26 as follows:

Considering this background, it clearly appears that there was a need to provide the capability to interact simultaneously with the human body and the external environment to a control system systems and/or methods for controlling a dynamic prosthesis in order to fulfill the needs of amputees, in particular those of above-knee amputees.

Please replace the paragraph beginning on page 5, line 3 as follows:

FIG. 2 shows the control system (100) being combined with artificial proprioceptors (20) and a prosthesis (14) having an actuating mechanism (16), such as shown in FIG. 1. The purpose of the control system (100) is to provide the required signals allowing to control the actuating

mechanism (16). To do so, the control system (100) is interfaced with the amputee (10) using the artificial proprioceptors (20) to ensure proper coordination between the amputee (10) and the movements of the prosthesis (14). The set of artificial proprioceptors (20) captures information, in real time, about the dynamics of the amputee's movement and provides provide that information to the control system (100). The control system (100) is then used to determine the resistance to be applied to a joint, in the case of a passive actuating mechanism, or the joint trajectories and the required force or torque that must be applied by a joint, in the case of an active actuating mechanism, in order to provide coordinated movements.

Please replace the paragraph beginning on page 5, line 15 as follows:

It should be noted that the present invention is not limited to its use with the mechanical configuration illustrated in FIG. 1. The control system (100) may be used with a leg prosthesis having more than one joint. For instance, it may be used with a prosthesis having an ankle joint, a metatarsophalangeal joint or a hip joint in addition to a knee joint. Moreover, instead of a conventional socket, a osseo-integrated devices could also be used, ensuring a direct attachment between the mechanical component of the prosthesis and the amputee skeleton. Other kinds of prostheses may be used as well.

Please replace the paragraph beginning on page 8, line 22 as follows:

FIGS. 8a to 8d show graphically the zero crossings for a typical localized plantar pressure signal, and its first three differentials, at the calcaneous region conditions, which may be used by the controller (40) to decompose the locomotion of the individual (10), while FIGS. 9a to 9d do so for the localized plantar pressure signal, and its first two differentials, at the MP region. This shows the relationships between the various data and derivative signals.